सत्यमेव जयते

Office of Principal Scientific Adviser
to the
Government of india

Minutes of the 4th Meeting

of the

Prime Minister's Science, Technology and Innovation Advisory Council (PM-STIAC)

16th January 2019

Vigyan Bhavan Annexe,
Maulana Azad Road,
New Delhi-110011

Minutes of the 4th meeting of the Prime Minister's Science Technology and Innovation Advisory Council (PM-STIAC)

Date: 16h January, 2019

Venue: Vigyan Bhavan Annexe
Maulana Azad Road
New Delhi-110011

The 4th meeting of the Prime Minister's Science Technology and Innovation Advisory Council (PM-STIAC) was held on the 16th of December 2019 under the chairmanship of Dr. K. VijayRaghavan, Principal Scientific Adviser to the Government of India. The list of participants is at **Annexure I** and the agenda of the meeting is at **Annexure II**.

In his opening remarks, the Chairman emphasised the need to mount closer inter-ministerial cooperation towards the effective planning and execution of all major national S&T missions identified by the PM-STIAC. This is a matter that has been reiterated several times by the Prime Ministers and Cabinet Ministers i.e. *the need to break out of our silos in development, planning and execution of projects and missions*. The Chair briefed the members on the agenda of the ongoing session. Thereafter, the agenda items (**Annexure II**) were presented by invited experts followed by discussions, which led to recommendations and action points.

I. The presentation by Shri Shashi Shekhar, Former Secretary, Ministry of Water Resources, Government of India on Brahmaputra River Basin Management and the subsequent discussions leading to recommendations and action points are summarised below.

Report on "Brahmaputra River Basin Management

The Brahmaputra river basin receives water from melting of glaciers as well as through abundant rainfall during the monsoon. The river basin forms a critical ecological lifeline of flora and fauna. High rainfall, sudden drop in gradient & high drainage density (35 tributaries) result in excessive siltation, bank erosion and floods on plain. Unplanned urban development and large number of planned hydro power projects contribute to siltation & flood problems. Thus, there is a need for multi-disciplinary applied approach for policy, planning and development. There is an urgent need to provide R&D based validated scientific input for river basin planning, management & development (scientific modelling, simulation, prediction) for Brahmaputra river. So far, water resource management approach ignores ecological dimension of the riverine ecosystem. Thus, rivers in India are fast drying-up, water table significantly depleted with unsustainable water resource management thereby a need for paradigm change. Also, Impact of climate change now makes it a necessity for Scientific Management of River Basins.

Action Points

1. To establish a robust data collection and its availability at basin scale for both surface as well as ground water for Brahmaputra Basin: Online network and data collection, Integration of flood forecasting including communication system
2. To integrate satellite imagery data to understand-Land use & changes, Geo-morphology, Soil type & its rain fall percolating characteristics
3. Make data and imageries available to R&D institutions for analysis and provide to government agencies, stake holders and policy makers
4. The R&D project for Brahmaputra Basin to be anchored in IIT(Guwahati)
5. The North East Council/ Brahmaputra River Authority – to use such scientific and research data & information for sustainable development

Recommendations

1. There is a need for multi-discipline approach based on scientific input including real time data collection of water resources
2. It is required to be undertaken on mission mode for all the river basins in the country-needed for sustainable development
3. There is a need to develop mechanisms to empower Brahmaputra River Management Authority there by binding the respective riparian states
4. Focus can also be given to not only database generation and management but also in application of such data
5. In situ observations of river needs to be done and made accessible to research institutions

II. The presentation by Professor Subhash Kak, School of Electrical and Computer Engineering, Oklahoma State University, Stillwater, USA on Meta search engine and the subsequent discussions leading to recommendations and action points are summarised below.

Presentation on Meta search engine as the anchor for developing specific artificial intelligence technologies

It is expected that US, China, and India will be the three largest economies within 10 years. Much of the value addition in products will be in AI applications for cybersecurity, pattern recognition, manufacturing, transportation, biomedical, finance. China is ahead of India due to the strategic decisions taken by it in developing its own Search Engine and Social Media companies that have spawned related AI technologies. These and related decisions have propelled China into the front rank of research in the AI field.

Action Points:

1. What is being searched on search engines can leak sensitive information of much critical importance (search is routinely used for forensics). Cyber-Security must be amped up.
2. An Indian Search Engine: Anviṣh (seek or search) is the way forward
3. Partnership between government and private industry

4. Guaranteed privacy and anonymization for governmental applications
5. India should become the anchor to develop proprietary AI technologies in the fields of search and security and other applications that use big data

Recommendations:

1. India should have its own search and social media companies; India is a passive user of technology
2. Issues of security and harvesting of data without due return (just storing data in India does not address the deeper issue of security) should be looked upon
3. Due to privacy concerns, France has decreed the use of the European Search Engine, 'Qwant' for all governmental work. Following the path of 'Qwant' will not be expensive and it will provide great payoff. India should do similarly
4. India can use AI to develop innovative products in the fields of healthcare, education, translation across languages and much more

III. A briefing on Earth Museum by Shri Sanjay Kumar, Journalist & Contributor, 'Science' and 'Nature' Journals and Shri Pranay Lal, Writer of Natural History, and the subsequent discussions leading to recommendations and action points are summarised below.

Brief on Earth Museum

India has a large depository of geological heritage with a repository of a variety of fossils and old rocks. There are more than 400 fossils on display in US and there are many new museums opening in china every week to showcase the heritage whereas there are only two dinosaur fossils on display in India. India has good repository but there is less being done to save these fossils as there is no law to protect or safeguard this geological heritage as a result, every day, fossils are being illegally acquired and sold without any repercussions. There is also a lack of awareness on part of the importance of these fossils therefore leading to people exploiting without understanding. No museum exists in the country that educates the public on India's geological treasures and caters to the needs of Earth Scientists including palaeontologists, geologists, among others.

Action Points

1. The need for an Earth Sciences Museum in India which fosters its own research, offers its own training and has a public education programme and outreach
2. No well-maintained sites or parks exist- Few known parks are in neglect and disarray
3. Lack of National Repository and Curate Facilities with a need to create National Repositories for 'Type Specimens', preservation of important fossils, mineral and rock collections made by individuals along with procurement and preservation of Critical Specimens, including specimens figured in publications.
4. Conservation of important geological and biographical sites

Recommendations

1. A brainstorming meet with international experts along with national experts for creating The Indian Museum of Earth- TIME in the first week of April 2019
2. This project will be a PPP model with participation of private sector, philanthropists and state governments; Potentially attract support and funding from Ministries of Earth Sciences; Culture; Mines; Science & Technology
3. Make this National Earth Museum accessible to Delhi/NCR – preferably in geological important region
4. Need for having virtual museum with wide knowledge repository platform catering to information dissemination and research to a wider audience which can co-exist with physical museum

Conclusion:

The Chairman summed up the discussions and highlighted the salient action points and recommendations that emerged from the discussions during the meeting. This was followed by a review of the action taken, and the progress made on the decisions taken in the past meetings.

The meeting ended with a vote of thanks to the Chair, all Council Members and special invitees.

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Annexure I

4th MEETING OF THE PRIME MINISTER'S SCIENCE, TECHNOLOGY AND INNOVATION ADVISORY COUNCIL (PM-STIAC).

Date : 16th of January, 2019

Time : 1330 hr – 1630 hr

Venue : Committee Room 'A', Vigyan Bhawan Annexe, Maulana Azad Road, New Delhi - 110011

List of Participants

S.No.	Name, Designation and Organization	Status
1.	**Dr. K. VijayRaghavan,** Principal Scientific Adviser to the Government of India, 318, Vigyan Bhawan Annexe, Maulana Azad Road, New Delhi- 110 011.	**Chairman**
2.	**Dr. V. K. Saraswat**, Member, NITI Aayog & former Secretary, Department of Defence R&D, South Block, New Delhi - 110011.	**Member**
3.	**Shri A. S. Kiran Kumar,** former Secretary, Department of Space and former Chairman, Indian Space Research Organisation, Department of Space, Government of India, Antariksh Bhavan, New BEL Road, Bangalore - 560 231.	**Member**
4.	**Dr. A. K. Sood**, Honorary Professor, Department of Physics, Indian Institute of Science, CV Raman Rd, Bengaluru, Karnataka - 560012.	**Member**
5.	**Maj. Gen. Madhuri Kanitkar,** Dean, Armed Forces Medical College (AFMC), Southern Command, Near Race Course, Solapur Road, Wanowrie, Pune, Maharashtra- 411040.	**Member**
6.	**Dr. Sanghamitra Bandyopadhyay,** Director, Indian Statistical Institute, Plot No. 203, Barrackpore Trunk Road, Baranagar, Kolkata, West Bengal - 700108.	**Member**
7.	**Shri Babasaheb N. Kalyani,** Chief Executive Officer and Managing Director, Bharat Forge Limited, State Highway 5, Mundhwa Industrial Area, Mundhwa, Pune, Maharashtra - 411036.	**Member**
8.	**Dr. Subhash Kak,** Professor, School of Electrical and Computer Engineering, Oklahoma State University, Stillwater, USA.	**Member and Invited Speaker**

9.	**Shri K. N. Vyas,** Secretary, Department of Atomic Energy, Anushakti Bhavan, C.S.M Marg, Mumbai, Maharashtra - 400001.	**Special Invitee**
10.	**Dr. Ashutosh Sharma,** Secretary, Department of Science & Technology, Room No. 14-B, Technology Bhawan, S&T Block I, New Mehrauli Road, Block C, Adchini, New Delhi - 110016.	**Special Invitee**
11.	**Dr. G. Satheesh Reddy,** Secretary, Department of Defence Research & Development, South Block, New Delhi – 110011.	**Special Invitee**
12.	**Dr. Madhavan Nair Rajeevan**, Secretary, Ministry of Earth Sciences, Prithvi Bhavan, Lodhi Road, Opp. India Habitat Centre, New Delhi - 110003.	**Special Invitee**
13.	**Shri Ajay Prakash Sawhney**, Secretary, Ministry of Electronics & Information Technology (Meity), Electronics Niketan, 6, CGO Complex, Lodhi Road, New Delhi - 110003.	**Special Invitee**
14.	**Dr. Shekhar C. Mande***,* Secretary, Department of Scientific and Industrial Research, Anusandhan Bhawan, 2 Rafi Marg, New Delhi, Delhi 110001.	**Special Invitee**
15.	**Shri Shashi Shekhar,** Former Secretary, Ministry of Water Resources, Government of India and honorary Scientific Consultant (Water Resources and Management), Office of the Principal Scientific Adviser to the Government of India, Vigyan Bhavan Annexe, Maulana Azad Road, New Delhi - 110 011.	**Invited Speaker**
16.	**Shri Sanjay Kumar,** Journalist & Contributor, 'Science' and 'Nature' Journals.	**Invited Speaker**
17.	**Shri Pranay Lal**, Writer of Natural History.	**Invited Speaker**
18.	**Dr. Arabinda Mitra,** Scientific Secretary, Office of Principal Scientific Adviser to the Government of India, 324, Vigyan Bhawan Annexe, Maulana Azad Road, New Delhi- 110 011.	**Secretary, PM-STIAC**
	Other Attendees	
19.	**Ms. Saloni Malhotra**, Vice-President, Invest India, Vigyan Bhavan Annexe, Maulana Azad Road, New Delhi – 110 011.	
20.	**Ms. Malyaj Varmani,** Assistant Vice-President, Invest India, Vigyan Bhavan Annexe, Maulana Azad Road, New Delhi – 110 011.	**PM-STIAC Sectt.**
21.	**Shri Nithin Chakki,** Manager, Invest India, Vigyan Bhavan Annexe, Maulana Azad Road, New Delhi – 110 011.	**PM-STIAC Sectt.**

22.	**Shri Phani Koundinya,** Assistant Vice President**,** Bharat Forge Limited, State Highway 5, Mundhwa Industrial Area, Mundhwa, Pune, Maharashtra - 411036.	
23.	**Shri Madhav Grover,** Invest India, Vigyan Bhavan Annexe, Maulana Azad Road, New Delhi – 110 011.	
	From O/o PSA to GoI	
24.	**Shri Neeraj Sinha,** Scientist 'G' / Adviser, Office of the Principal Scientific Adviser to the Government of India, 326, Vigyan Bhavan Annexe, Maulana Azad Road, New Delhi - 110 011.	**PM-STIAC Sectt.**
25.	**Dr. Ketaki Bapat,** Scientist 'F', Office of the Principal Scientific Adviser to the Government of India, Vigyan Bhavan Annexe, Maulana Azad Road, New Delhi - 110 011.	
26.	**Dr. Arun Bhardwaj**, Scientist 'E', Office of the Principal Scientific Adviser to the Government of India, Vigyan Bhavan Annexe, Maulana Azad Road, New Delhi - 110 011.	
27.	**Shri Shirish Panda**, Scientist 'D', Office of the Principal Scientific Adviser to the Government of India, 324A, Vigyan Bhavan Annexe, Maulana Azad Road, New Delhi – 110 011.	**PM-STIAC Sectt.**
28.	**Ms. Remya Haridasan,** Scientist 'D', Office of the Principal Scientific Adviser to the Government of India, 324A, Vigyan Bhawan Annexe, Maulana Azad Road, New Delhi – 110 011.	**PM-STIAC Sectt.**

Annexure II

4th meeting of the Prime Minister's Science, Technology and Innovation Advisory Council (PM-STIAC)

Date: **16th January, 2019**

Time: **1330 hr-1630 hr**

Venue: **Committee Room 'A', Vigyan Bhawan Annexe, Maulana Azad Road, New Delhi - 110011**

AGENDA

1300hr –1330hr	Lunch
1330hr –1345hr	Welcome address by the **Chairman,** Prof. K. VijayRaghavan.
1345hr –1445hr	Reporting and discussion on the action taken based on the recommendations of the 1st, the 2nd and the 3rd meetings of the PM- STIAC.
1445hr –1500hr	Summing up by the **Chairman.**
1500hr –1510hr	A Report on **"Brahmaputra River Basin Management"** by Shri Shashi Shekhar, Former Secretary, Ministry of Water Resources, Government of India.
1510hr –1525hr	Discussion, leading to recommendations, with action points.
1525hr –1535hr	A presentation by Dr. Subhash Kak on **"Meta search engine as the anchor for developing specific artificial intelligence technologies".**
1535hr –1550hr	Discussion, leading to recommendations, with action points.
1550hr –1600hr	A briefing on **"Earth Museum"** by Shri Sanjay Kumar.
1600hr –1615hr	Discussion, leading to recommendations, with action points.
1615hr –1625hr	Summing up by the **Chairman**.
1625hr –1630hr	Vote of Thanks by the **Scientific Secretary**, Office of Principal Scientific Advisor to the Government of India.